

## Two New and One Newly Recorded Species of Flesh Flies from the Northern Vietnam (Diptera, Sarcophagidae)

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**Abstract** Two new species of sarcophagine flesh flies, *Sarcosolomonina hai* sp. nov. and *Pierretia thinhi* sp. nov. are described from the northern Vietnam. A little known Chinese species, *Pandelleana struthiodes* Xue, Feng et Liu, 1986 is newly recorded and redescribed from Vietnam. Male genitalia and fifth sternites are illustrated for these three species. Female genitalia and sternites of *P. struthiodes* is also illustrated.

**Key words:** Diptera, new species, Northern Vietnam, *Pierretia*, *Sarcosolomonina*, *Pandelleana struthiodes*, Sarcophagidae.

### Introduction

The present paper deals with the descriptions of two new species and the re-description of a newly recorded species of the sarcophagine flesh flies based upon the specimens collected by the second author on the National Science Museum Northern Vietnam Expedition 1999. One of these new species belongs to the genus *Sarcosolomonina* and the others to the genus *Pierretia* in Fan's sense (Fan, 1992). These two genera are recorded from Vietnam for the first time. *Pandelleana struthiodes* Xue, Feng et Liu, 1986 from Sichuan Prov., China is newly recorded from Vietnam by the expedition in 1999. Male genitalia and fifth sternites are illustrated for these three species. Female genitalia and sternites of *P. struthiodes* is also illustrated based on the specimen copulated with typical male. A total 38 species of Sarcophagidae are previously recorded from Vietnam (Lopes *et al.*, 1977; Fan, 1992; Pape, 1996; Thinh, 1988; Kano *et al.*, 1999).

### *Sarcosolomonina hai* sp. nov.

♂.-Head: eyes bare, dichoptic; frons index 0.19; frontal stripe black, broad, broader than width of ocellar triangle at narrowest point, widened anteriorly and posteriorly; parafrontalia snowy white anteriorly, silver-grey dusted posteriorly, sparsely

with black setulae, provided with ca 12 pairs of *ori*, 1 prevertical bristle developed; *iv* also strongly developed; *poc* weakly developed; *pooc* parallel; *occ* 1; parafacialia silver-grey dusted, with black setulae, the several setulose hairs rather long on lower 1/3; face grey-dusted, without carina; facialia silver-grey dusted, with black setulae on lower 2/3; medianae blackish, silver-grey dusted, bare; vibrissaria very narrow, with a few black setulae; vibrissae strongly developed; epistome brownish, grey-dusted, not conspicuous; gena black, silver-grey dusted, clothed with black hairs; postgena concolorous with gena, clothed with yellowish white hairs except for several black hairs along oral margin; occiput clothed with yellowish white hairs on central and lower portions; 2–3 irregular rows of black setulose hairs just below row of occipital bristles; 2nd antennal segment black, subshining; 3rd antennal segment entirely black, greyish pubescent,  $2.5\times$  as long as 2nd; arista long plumose on basal 3/4. Palpi black, black-haired.

Thorax: black, grey-dusted, three black, broad longitudinal stripes on scutum when viewed behind; humeri, postalar calli and scutellum concolorous with thoracic dorsum, scutellum with median dark spot basally; prosternum with black hairs; propleura bare; supraspiracular convexity greyish pubescent; hypopleural hairs black, bearing along upper and posterior margins; other pleural hairs black; mesothoracic spiracle black; metathoracic one black; postalar declivity with tuft of black hairs in central circle; tympanic tuft absent; anterior parasquamal tuft absent. Chaetotaxy: *ac* 3+2; *dc* 3+4, 1 strong bristle developed in front of anterior presutural *dc*; *ia* 1+3–4; *h* 3–4; *ph* 2; *prs* 1; *sa* 3; *pa* 2; *st* 1+1+1; *sc* 3+1; *n* 4; *pp* 1, with several bristly hairs; *pst* 1–2.

Wings: hyaline, slightly infuscated along veins anteriorly; veins dark brown; epaulet blackish; basicosta yellowish white; subcostal sclerite yellowish brown, pubescent; node of 2nd and 3rd longitudinal veins with several black hairs; 4th longitudinal vein bent with an obtuse angle; 4th section of the 4th vein from bend to wing edge slightly inflexed and then straight; squamae whitish; thoracic one very slightly brownish along margin, bare on upper surface. Halteres brown.

Legs: black, more or less grey-dusted, rather densely dusted on femora, black-haired; fore tibia with 2 subbasal *ad* and 1 *p* on apical 1/3; mid tibia 1 *a* and 1 *pd* on apical 1/3, 3 *p* and 1 *v*; hind tibia with 1 strong submedian *ad* and row of 9 short and rather long *ad*, 2 *pd* and row of short *pd* present, 1 strong *av* and 2–3 fine *av* present on apical 1/2.

Abdomen: black, grey-dusted, tessellated on tergites 3–5; black median stripe distinct in posterior view; tergites 1+2–3 with a strong lateral marginal bristle, tergite 3 also with strong median marginal bristles; tergite 4 with a strong median and 4–5 lateral marginal bristles; tergite 5 with a row of strong marginal bristles; sternites black, black haired; Hypopygium prominent, black, submetallic, black haired; male genitalia and 5th sternite as shown in Fig. 1, A.

♀.-Unknown.

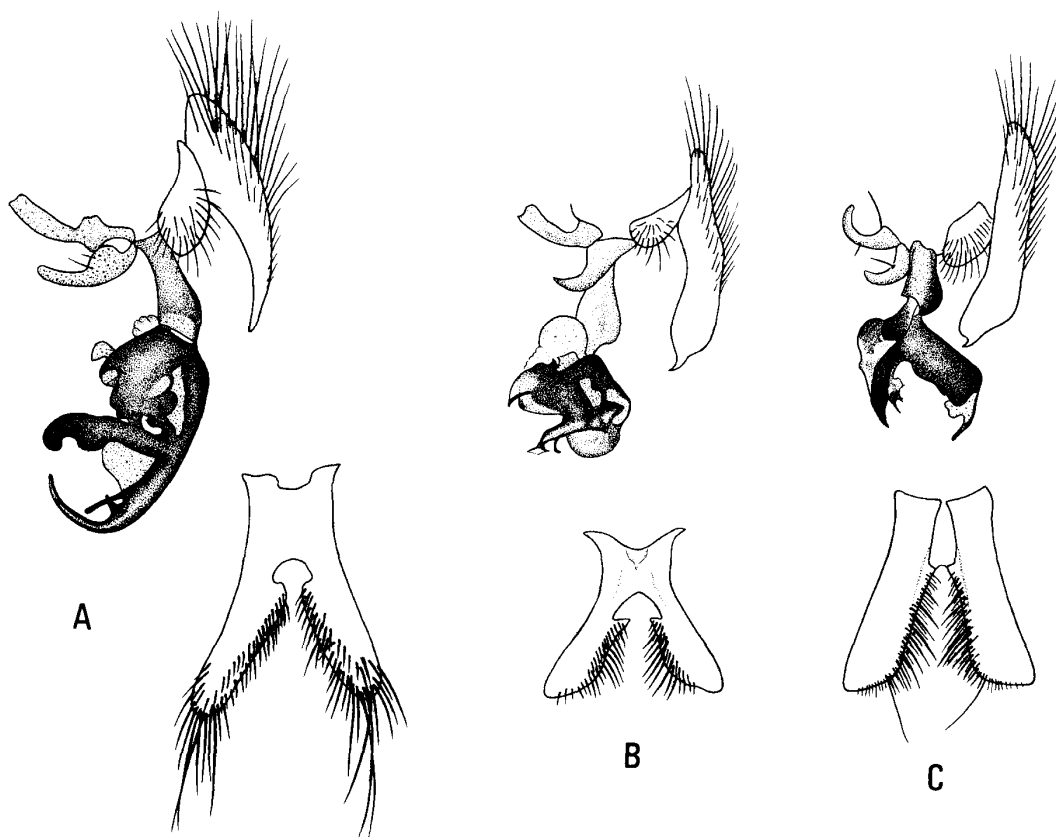


Fig. 1. Male genitalia (lateral view) and fifth sternites (ventral view) of two new and one newly recorded species. A: *Sarcosolomonina hai* sp. nov., B: *Pandelleana struthiodes* Xue, Feng et Liu, C: *Pierretia thinhi* sp. nov.

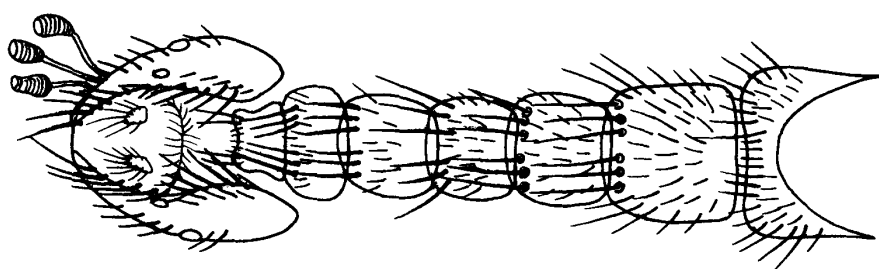


Fig. 2. Female genitalia and sternites of *Pandelleana struthiodes* Xue, Feng et Liu.

Length: 7.0–12.8 mm.

Holotype ♂, VIETNAM: Vinh Phu Prov., Mt. Tam Dao, 930–1,230 m, 15–17. v. 1999, H. Kurahashi. Paratypes. VIETNAM: 36 ♂, same data as holotype.

This species is dedicated to Prof. Dr. Ha Quang Hung of Hanoi Agricultural University.

*Type depository.* Holotype is preserved in National Science Museum, Tokyo.

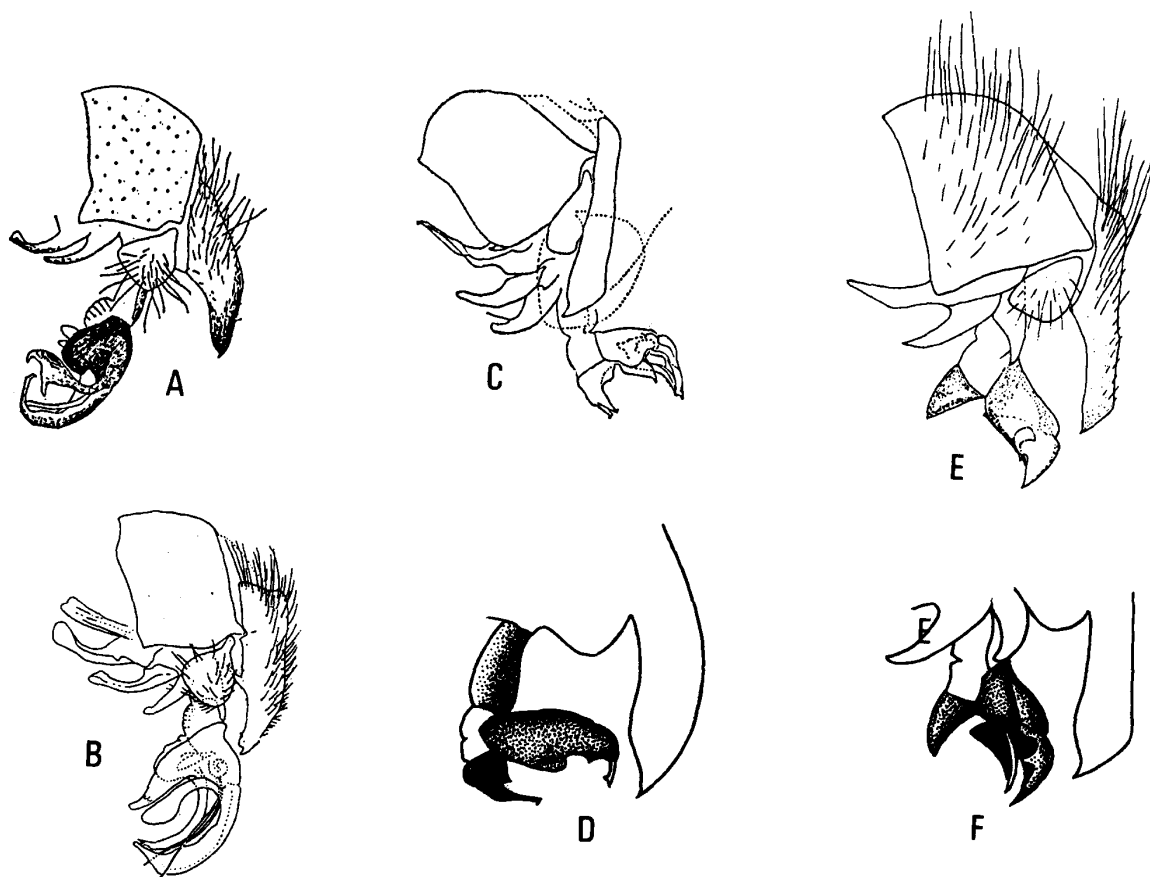


Fig. 3. Male genitalia of sarcophagine flies closely related to two new species. A: *Hoa flexuosa* (Ho, 1934) (after Fan, 1992), B: *Sarcosolomonina hongheensis* Li et Ye, 1992 (after Fan, 1992), C: *Pierretia situliformis* Zhong, Wu et Fan, 1981 (after Fan, 1992), D: *Pierretia situliformis* from Nepal, E: *Pierretia lini* (Sugiyama, 1987) (after Sugiyama, 1987), F: *Pierretia lini* from Taiwan (Holotype).

Paratypes in National Science Museum, Tokyo (7♂); Reference Museum, Department of Medical Entomology, National Institute of Infectious Diseases, Tokyo (7♂); Insect Ecology Department, Institute of Ecology and Bioresources, Hanoi (7♂); Bishop Museum, Honolulu (7♂); Natural History Museum, London (4♂); and Swedish Museum of Natural History, Stockholm (4♂).

**Remarks.** The present new species can be distinguished from *Sarcosolomonina hongheensis* Li et Ye, 1992 from Yunnan Province, and *Hoa flexuosa* (Ho, 1934) from Beijing, China, by the characteristic shapes of cerci and aedeagus as shown in Fig. 1, A. Cerci and aedeagus of the former two species are shown in Fig. 3, A & B for a comparison (traced after Fan, 1992: Figs 1326 & 1327).

**Bionomics.** Male flies were found topping the peak of Mt. Tam Dao and resting on leaves and tree trunks around the top.

**Distribution.** Vietnam.

*Pandelleana struthiodes* Xue, Feng et Liu

♂.-Head: eyes bare, dichoptic; frons index 0.20; frontal stripe broad, widened anteriorly and posteriorly, black, broader than  $2\times$  width of one of parafrontalia at narrowest point, 3 pairs of fine cruciate bristly hairs present along lateral margins; parafrontalia yellowish-grey dusted, darkened toward vertex, with rather fine long setulae on entire length, provided with ca 10 pairs of *ori* and a strong reclinate *ors* developed as preverticals; parafacialia dull yellowish-grey dusted, with rather fine long setulae, lower 3–4 becoming rather strong. face grey-dusted, without carina; facialia grey-dusted, with black setulae on lower 1/2; mediana narrow, black, yellowish-grey dusted; vibrissaria very narrow, with black setulae; vibrissa strongly developed; epistome fuscous brown, not projecting forward from vibrissal angle; gena grey-dusted, with yellowish tinge anteriorly, clothed with black hairs; postgena concolorous with gena, clothed with yellowish white hairs; occiput grey-dusted, clothed with yellowish white hairs on central and lower portions; 2nd antennal segment black; 3rd antennal segment black, slightly grey-dusted under certain incidence of light; arista black, long plumose on basal 1/3, fuscous brown apically; palpus black, black-haired.

Thorax: black, grey-dusted, with three broad black longitudinal stripes on dorsum; humerus, postalar callus and scutellum concolorous with thoracic dorsum; prosternum blackish-haired on posterior 1/2; propleuron bare; supraspiracular convexity without upstanding hair; hypopleural hairs black, bearing along upper and posterior margins; other pleural hairs black; mesothoracic spiracle black; metathoracic one blackish; postalar declivity with black hairs on central circle; tympanic tuft absent; anterior parasquamal tuft absent. Chaetotaxy: *ac* 0+1 as prescutellars; *dc* 5+3; *ia* 0+2; *h* 3; *ph* 3; *prs* 1; *sa* 3; *pa* 2; *st* 1+1+1; *sc* 4+1, basal and apical ones fine, 2 laterals strong; *n* 4; *pp* 1+4–5 fine additional; *pst* 1+2 fine additional.

Wings: hyaline, slightly brown-tinged along veins; veins dark brown; epaulet black; basicosta yellowish, with orange tinge; subcostal sclerite yellowish brown basally, dark brown and pubescent on apical 2/3; node of 2nd and 3rd longitudinal veins with several black setulae, the setulose hairs on upper surface extending 1/3 from base to r-m; 4th longitudinal vein bent with sharp angle; section of the 4th vein from bend to wing edge strongly inflexed and then straight; alar squama fuscous brown, with pale base and margin; thoracic one fuscous brown, bare on upper surface; halteres brown.

Legs: black, slightly grey-dusted on femora, black-haired; fore tibia with 3 short *ad* on basal 1/3 and 1 *p* on apical 1/3; mid tibia 1 strong *ad* on apical 1/3 and 1 short submedian *ad*, 2 *pd* on basal 1/3 and apical 1/3, and 1 *v* on apical 1/3; hind tibia well fringed on antero- and postero-ventral surfaces, with 2 strong *ad* and row of short *ad*, 2 *pd* and 2 short subbasal additional *pd*.

Abdomen: black, grey-dusted; with tessellated patterns, black haired; black median stripe visible on tergites 3–5, tergite 1+2 largely blackish except for greyish

spots on lateral corner, with 2 strong erect and 1 decumbent lateral marginals; tergite 3 with 2 strong erect and 1 decumbent lateral marginals; tergite 4 with a pair of erect median and several erect lateral marginals; tergite 5 with row of strong marginals; sternites black, more or less grey-dusted, clothed with black hairs; hypopygium prominent, GS1 black, grey-dusted, black-haired; GS2 (epandrium) black, subshining, black-haired; male genitalia and 5th sternite as shown in Fig. 1, B.

♀.-Head: eyes dichoptic; frons index 0.27; frontal stripe black, broad, parallel-sided, slightly narrowed posteriorly,  $1.5\times$  the width of 1 of parafrontalia just in front of anterior ocellus; parafrontalia provided with ca 11 pairs of *ori*; *ors* 2+1; *oc* well developed; *acoc* weakly developed; *pooc* weakly developed; *ov* and *iv* strongly developed; *poc* of 3 pairs; *occ* 1, rather strong. Thorax and wings: similar to those of male. Legs: hind tibia without fringes on antero- and posteroventral surfaces. Otherwise similar to those of male. Abdomen: stout, rounded, marginal bristles on tergite 3 more or less decumbent. Otherwise same as for male. Ovipositor short, as shown in Fig. 2. Otherwise same as for ♂.

Length: 10.0 mm in ♂, 9.0–10.5 mm in ♀.

*Specimens examined.* VIETNAM: 1 ♂ 1 ♀ copulated, Lao Cai Prov., nr. Sapa, O Quy Ho, 1,750 m, 1. vi. 1999, H. Kurahashi (NSMT); 4 ♂ 4 ♀, Cao Ban Prov., Mt. Pia Oac, 1,320 m, 23–27. v. 1999, H. Kurahashi (NIID, IEB).

*Remarks.* The present species is closely related to *Pierretia lini* (Sugiyama, 1987) from Taiwan and *P. situliformis* Zhong, Wu et Fan, 1982 from Tibet and Nepal, but can be distinguished from them by the shape of male genitalia as shown in Fig. 1, B. Male genitalia of the former two species are traced for a comparison after Sugiyama *et al.*, 1987 (Figs. 6–8) and Fan, 1992 (Fig. 1344).

*Bionomics.* Unknown.

*Distribution.* China (Sichuan) and Vietnam.

### ***Pierretia thinhi* sp. nov.**

♂.-Head: eyes dichoptic, separated at vertex by  $4.5\times$  the width of ocellar triangle; frons index 0.21, narrowest at 8–9th pairs of *ori*; frontal stripe black, broad, widened anteriorly and posteriorly, narrowest at 8–9th pairs of *ori*,  $4.5\times$  the width of 1 of parafrontalia just in front of anterior ocellus; parafrontalia densely grey-dusted, darkened toward vertex, sparsely with black setulae, provided with ca 11 pairs of *ori*; *ors* 0+1, reclinate *ors* developed as preverticals; *oc* developed; *acoc* absent; *pooc* weakly developed, divergent; *poc* of 2 pairs developed, divergent; *iv* well developed, *ov* less developed, usually shorter than  $2/3$  the length of *iv*; *occ* 1, rather strongly developed, convergent; parafacialia densely grey-dusted, very slightly with yellowish brown tinge on lower portion, with a row of black, short setulae along anterior margin of eye, the lowest setula longest; face black, densely grey-dusted, without median carina; facialia black, grey-dusted, with black setulae on lower half; mediana narrow,

black, grey-dusted, bare; vibrissaria very narrow, black, with black, strong hairs; vibrissa strongly developed; epistome blackish, grey-dusted, not projecting forward; gena black, densely grey-dusted, clothed with black hairs; postgena concolorous with gena, clothed with yellowish white hairs entirely; occiput concolorous with gena, largely clothed with yellowish white hairs on central and lower portions, at least 3 rows of black hairs present below occipital row of bristles; 2nd antennal segment black, with 1 strong setula and several black setulose hairs; 3rd antennal segment black, pubescent,  $2.5\times$  as long as 2nd; arista blackish except for yellowish brown median portion, long plumose on basal  $2/3$ ; palpus black, with black setulae.

Thorax: black, grey to dark grey-dusted on anterior parts of prescutum, humeri, notopleura and postalar calli; one broad median and two fine submedian and broad lateral longitudinal stripes distinguishable on prescutum, median and lateral broad ones not interrupted by transverse suture, but submedian one disappeared behind the suture, clothed with black ground hairs; humeri, postalar calli and scutellum concolorous with thoracic dorsum; prosternum hairy; propleuron bare; suprascutular convexity bare; hypopleural hairs black, present along the row of *hp*, other pleural hairs also black; mesothoracic spiracle blackish; metathoracic one blackish; postalar declivity with tuft of black hairs in central circle; tympanic tuft absent; anterior parasquamal tuft absent. Chaetotaxy: *ac* 0+1; *dc* 5+3; *ia* 1+2, presutural *ia* weakly developed; *h* 3; *ph* 2; *prs* 1; *sa* 3; *pa* 2; *st* 1+1+1; *sc* 3+1; *n* 4; *pp* 1 (strong)+several (5–6) fine additional; *pst* 1 (strong) and 1 fine additional.

Wings: hyaline; veins blackish brown; epaulet black; basicosta yellowish white; subcostal sclerite brown, pubescent; first longitudinal vein bare; node of 2nd and 3rd longitudinal veins with several black setulae below; 3rd longitudinal vein setulose on  $1/3$  way from node to anterior cross vein r-m above; 4th longitudinal vein bent with sharp angle; section of the 4th vein from bend to wing edge inflexed, and then straight;  $R_5$  open; alar squama pale whitish brown, with pale brownish hairs on inner ventral margin; thoracic one pale whitish brown, dark brown in part, bare on upper surface, margin and fringe pale in colour. Halteres fuscous brown.

Legs: black, grey-dusted, clothed with black hairs; fore tibia with 3 *ad* on basal  $1/3$  and 1 *p* on apical  $1/3$ ; mid tibia with 1–2 *ad*, 3 *pd*, 1 *p* and 1 *v*; hind tibia with 2 strong *ad* and 2 strong *pd* and rows of short *ad* and *pd*, long fringes developed on antero- and postero-ventral surfaces; hind coxa black haired behind.

Abdomen: black, more or less dark grey to brownish-grey dusted, tessellated, clothed with black hairs; tergite 1+2 with several lateral marginal bristles and some additional in front of marginal row; tergite 3 with 4 erect lateral marginal bristles, without median one; tergite 4 with strong median marginal bristles and 4–5 strong lateral marginals; tergite 5 with complete row of strong erect marginal bristles; sternites concolorous with tergites, grey-dusted, clothed with black hairs; Hypopygium prominent, GS1 (epandrium) black, brownish-grey dusted, black-haired; GS2 black shining, black-haired, male genitalia and 5th sternite as shown in Fig. 1, C.

Length: 12.5 mm in ♂.

Holotype ♂, VIETNAM: Cao Ban Prov., Mt. Pia Oac, 1,320 m, 23–27. v. 1999, H. Kurahashi. Paratype. VIETNAM: 1 ♂, same data as holotype.

This new species is dedicated to Dr. Ta Huy Thinh, Institute of Ecology and Bioresources, Hanoi, who is a local dipterist studying Sarcophagidae.

*Type depository.* Holotype ♂ is preserved in National Science Museum, Tokyo. Paratype in Reference Museum, Department of Medical Entomology, National Institute of Infectious Diseases, Tokyo (1 ♂).

*Remarks.* The general appearance is similar to *Pandelleana struthiodes*, but male genitalia of each species is very characteristic as shown in Fig. 1, B and C.

*Bionomics.* Unknown.

*Distribution.* Vietnam.

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